Patent claims

1. A magnetic field sensor comprising a sensor arrangement (H), which is supplied by a supply device (IH) and generates a sensor signal, comprising an evaluation device (ADC, R), to which the sensor signal is fed and which outputs a first output signal (AI), and comprising a feedback device (RV), to which the first output signal is fed and which controls the supply device.

2. The magnetic field sensor as claimed in claim 1, characterized in that the sensor arrangement contains a Hall element arrangement (H), which is fed by a Hall current (IH) and generates a Hall signal as sensor signal, and comprising a feedback device embodied as an amplification device (RV), to which the first output signal is fed and which controls the Hall current.

3. The magnetic field sensor as claimed in claim 1 or 2, characterized in that the first output signal corresponds to the actual value amplitude (AI) of the sensor signal and the feedback device (RV) sets the supply device with the aid of a predetermined desired value amplitude (AS) such that the amplitude of the sensor signal remains constant.

4. The magnetic field sensor as claimed in either of claims 2 or 3, characterized in that the Hall element arrangement detects a rotating magnetic field and a second output signal (W) of the evaluation device corresponds to the rotation angle determined.

5. The magnetic field sensor as claimed in one of claims 2 to 4, characterized in that the Hall signal of the Hall element arrangement contains a first measurement signal (sin W) and a second measurement

signal (cos W), which is phase-shifted by 90° relative to the first measurement signal.

6. The magnetic field sensor as claimed in one of claims 1 to 5, characterized in that the evaluation device contains an analog-to-digital converter (ADC), which digitizes the sensor signal, and a computation device (R) connected downstream, which generates the first and/or the second output signal (AI, W).

7. The magnetic field sensor as claimed in one of claims 1 to 6, characterized in that the feedback device contains a comparator (K), which compares the first output signal (AI) with a reference value (AS), in that a counter (Z) is connected downstream of the comparator, the output signal of the comparator being fed to said counter, and in that a digital-to-analog converter (DAC) is connected downstream of the counter, and converts the output signal of the counter into a control signal for the supply device.

8. A method for the operation of a magnetic field sensor, in particular a magnetic field sensor as claimed in one of claims 1 to 6, in which a supply device (IH) supplies a sensor element of the magnetic field sensor and the sensor element generates a sensor signal that is conditioned by means of an evaluation device (ADC, R) to form a first output signal (AI) and is fed to a feedback device (RV), which controls the supply device on the output side.

9. The method as claimed in claim 8, characterized in that the actual value amplitude (AI) of the sensor signal is derived from the first output signal and the feedback device (RV) sets the supply device with the aid of a predetermined desired value amplitude (AS) such that the actual value amplitude of the sensor signal remains constant.

10. The method as claimed in claim 8 or 9, characterized in that a rotating magnetic field is detected by means of the sensor element and a second output signal (W) corresponding to the rotation angle is generated by means of the evaluation device.

11. The method as claimed in one of claims 8 to 10, characterized in that a sensor element embodied as a Hall element arrangement is arranged in such a way that the Hall signal contains a first measurement signal (sin W) and a second measurement signal (cos W), which is phase-shifted by 90° relative to the first measurement signal.

12. The method as claimed in one of claims 8 to 11, characterized in that the evaluation device digitizes the sensor signal by means of an analog-to-digital converter (ADC), and a computation device (R) connected downstream of the evaluation device generates the first and/or the second output signal (AI, W).

13. The method as claimed in one of claims 8 to 12, characterized in that the first output signal (AI) is compared with a reference value (AS) in a comparator, in that a counter (Z) connected downstream of the comparator derives a count from the output signal of the comparator and a digital-to-analog converter (DAC) converts the output signal of the counter into a control signal for the supply device.